

CLAIMS

1. DNA coding for a chimeric receptor containing two or more independent polypeptide chains each of said chains comprising in a  
5 N- to C-terminus sequence:  
(1) an extracellular ligand association domain;  
(2) a transmembrane domain; and  
(3) one or more intracellular domains;  
provided that at least two of said domains in one chain are not  
10 naturally fused to each other.
2. DNA according to Claim 1 wherein each extracellular ligand association domain coded for is an antibody variable region ( $V_H$  or  $V_L$ ) domain, a T-cell receptor variable region domain (TCR $\alpha$ , TCR $\beta$ , TCR $\gamma$ , TCR $\delta$ ), CD8 $\alpha$ , CD8 $\beta$ , CD11a, CD11b, CD11c, CD18, CD29, CD49a, CD49b, CD49c, CD49d, CD49e, CD49f, CD61, CD41 or CD51 chain or a fragment thereof.
3. DNA according to Claim 2 wherein each association domain is  
20 structurally different to each other.
4. DNA according to Claim 1 wherein the ligand association domains of the chimeric receptor coded for are a  $V_H$  domain paired with a  $V_L$  domain, two or more TCR $\alpha$ , TCR $\beta$ , TCR $\gamma$ , and/or TCR $\delta$  domains, a  
25 CD8 $\alpha$  or  $\beta$  homo- or heterodimer, CD18 paired with one or more of CD11a, b, or c, CD29 paired with one or more of CD49a, b, c, d, e, or f, and CD61 paired with CD41c and/or CD51.
5. DNA according to any of the preceding Claims wherein each  
30 intracellular domain coded for is a naturally occurring polypeptide signalling sequence.
6. DNA according to Claim 5 wherein each signalling sequence is all or part of the zeta, eta or epsilon chain derived from the T-cell receptor; CD28; CD4; CD8; the  $\gamma$  chain of a Fc receptor; a signalling component from a cytokine receptor, a colony stimulating factor

*Claim 1*

*a*

receptor, a tyrosine kinase and binding domains thereof; or an adhesion molecule.

*Claim 1*

7. DNA according to any one of Claims 1 to 6, wherein the transmembrane domain coded for is an oligo- or polypeptide derived from all or part of the alpha, beta or zeta chain of the T-cell receptor, CD28, CD8, CD4, CD3 $\varepsilon$ , CD45 and members of the tetraspan family, a cytokine receptor, or a colony stimulating factor receptor.

*Claim 1*

- 10 8. DNA according to any one of Claims 1 to 7, wherein each independent polypeptide chain coded for additionally contains a spacer domain positioned between the ligand association domain and the transmembrane domain.

- 15 9. DNA according to Claim 8 wherein each spacer domain is a polypeptide comprising 20 to 100 amino acids.

*Claim 1*

- 20 10. DNA according to any one of Claims 1 to 9 wherein each independent polypeptide chain coded for additionally has a secretion signal sequence attached to the N-terminus of the association domain of each chain.

*Claim 1*

- 25 11. DNA according to any of the preceding Claims wherein the chimeric receptor coded for has two independent polypeptide chains.

12. DNA according to Claim 11 wherein one polypeptide chain has a ligand association domain which is a V<sub>H</sub> domain or a fragment thereof, and the other has a ligand association domain which is a V<sub>L</sub> domain or a fragment thereof.

*Claim*

- 30 13. DNA according to any one of Claims 1 to 12 in association with a carrier.

- 35 14. DNA according to Claim 13 wherein the carrier is a viral vector, a liposomal vector, a cationic lipid or an antibody.

- ~~15. DNA according to Claim 13 wherein the carrier is a targeted carrier.~~

~~16. DNA according to any one of Claims 1 to 15 which is located on a plasmid.~~

~~17. Plasmid pHMF374 as described in Figure 3 herein.~~

~~18. An effector cell containing DNA or a plasmid according to any one of Claims 1 to 17.~~

*Claim 1*

Add C.